

## 4-2

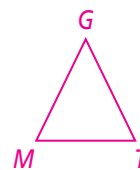
## Practice

Form G

## Triangle Congruence by SSS and SAS

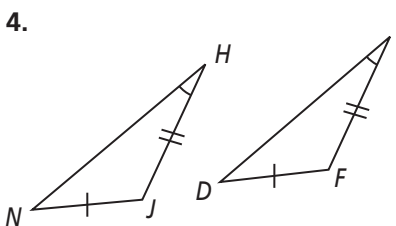
Draw  $\triangle MGT$ . Use the triangle to answer the questions below.

1. What angle is included between  $\overline{GM}$  and  $\overline{MT}$ ?  $\angle M$
2. Which sides include  $\angle T$ ?  $\overline{GT}$  and  $\overline{TM}$
3. What angle is included between  $\overline{GT}$  and  $\overline{MG}$ ?  $\angle G$



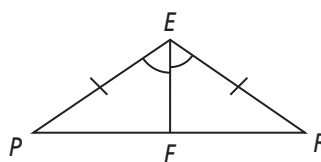
Would you use SSS or SAS to prove the triangles congruent? If there is not enough information to prove the triangles congruent by SSS or SAS, write *not enough information*. Explain your answer.

4.



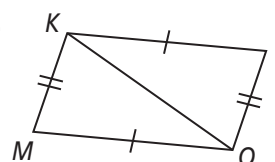
Not enough information; two pairs of corresponding sides are congruent, but the congruent angle is not included.

5.



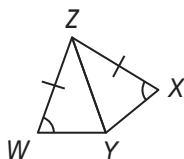
SAS; two pairs of corresponding sides and their included angle are congruent.

6.



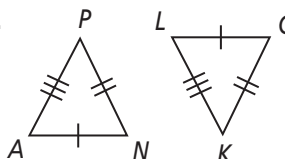
SSS; three pairs of corresponding sides are congruent.

7.



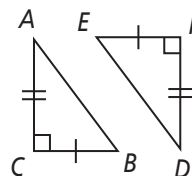
Not enough information; two pairs of corresponding sides are congruent, but the congruent angle is not the included angle.

8.



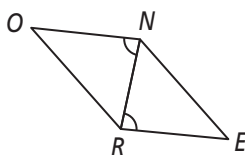
SSS; three corresponding sides are congruent.

9.



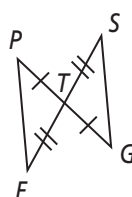
SAS; two pairs of corresponding sides and their included right angle are congruent.

10.



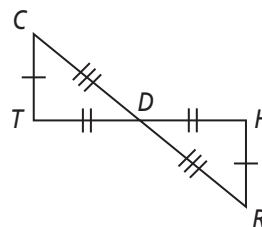
Not enough information; one pair of corresponding sides and corresponding angles are congruent, but the other pair of corresponding sides that form the included angle must also be congruent.

11.



SAS; two pairs of corresponding sides and their included vertical angles are congruent.

12.



SSS or SAS; three pairs of corresponding sides are congruent, or, two pairs of corresponding sides and their included vertical angles are congruent.

# 4-2

## Practice (continued)

Form G

### Triangle Congruence by SSS and SAS

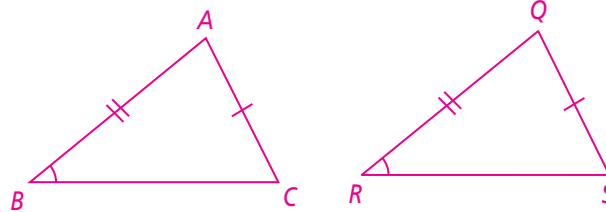
13. **Draw a Diagram** A student draws  $\triangle ABC$  and  $\triangle QRS$ . The following sides and angles are congruent:

$$\overline{AC} \cong \overline{QS} \quad \overline{AB} \cong \overline{QR} \quad \angle B \cong \angle R$$

Based on this, can the student use either SSS or SAS to prove that  $\triangle ABC \cong \triangle QRS$ ?

If the answer is no, explain what additional information the student needs. Use a sketch to help explain your answer.

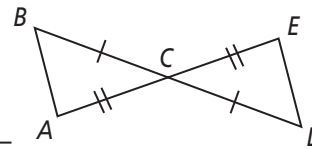
**No;  $\angle B$  and  $\angle R$  are not the included angles for the sides given. To prove congruence, you would need to know either that  $\overline{BC} \cong \overline{RS}$  or  $\angle Q \cong \angle A$ .**



14. Given:  $\overline{BC} \cong \overline{DC}$ ,  $\overline{AC} \cong \overline{EC}$

Prove:  $\triangle ABC \cong \triangle EDC$

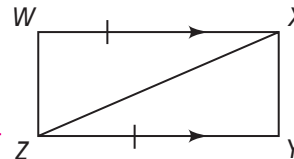
Statements	Reasons
1) $\overline{BC} \cong \overline{DC}$	1) Given
2) $\overline{AC} \cong \overline{EC}$	2) Given
3) $\angle BCA \cong \angle DCE$	3) Vertical $\angle$ s are $\cong$ .
4) $\triangle ABC \cong \triangle EDC$	4) SAS



15. Given:  $\overline{WX} \parallel \overline{YZ}$ ,  $\overline{WX} \cong \overline{YZ}$

Prove:  $\triangle WXZ \cong \triangle YZX$

Statements	Reasons
1) $\overline{WX} \parallel \overline{YZ}$	1) Given
2) $\angle WXZ \cong \angle YZX$	2) Alternate Interior $\angle$ s are $\cong$ .
3) $\overline{WX} \cong \overline{YZ}$	3) Given
4) $\overline{ZX} \cong \overline{XZ}$	4) Reflexive Property
5) $\triangle WXZ \cong \triangle YZX$	5) SAS



16. **Error Analysis**  $\triangle FGH$  and  $\triangle PQR$  are both equilateral triangles. Your friend says this means they are congruent by the SSS Postulate. Is your friend correct? Explain. **Incorrect; both triangles being equilateral means that the three angles and sides of each triangle are congruent, but there is no information comparing the side lengths of the two triangles.**
17. A student is gluing same-sized toothpicks together to make triangles. She plans to use these triangles to make a model of a bridge. Will all the triangles be congruent? Explain your answer. **Yes; because all the triangles are made from the same-sized toothpick, all three corresponding sides will be congruent.**

# 4-2

## Practice

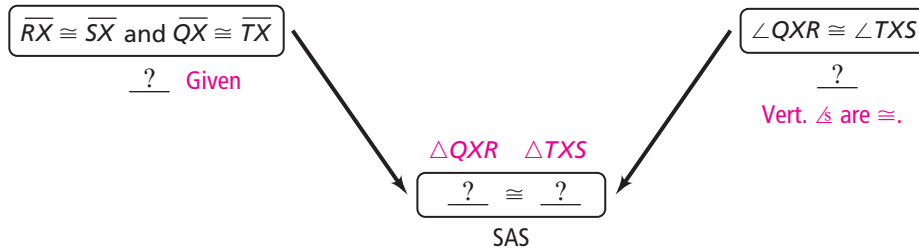
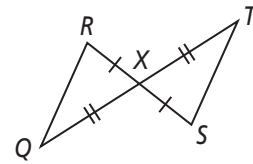
Form K

### Triangle Congruence by SSS and SAS

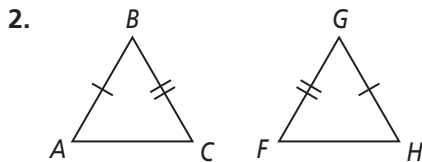
1. **Developing Proof** Copy and complete the flow proof.

Given:  $\overline{RX} \cong \overline{SX}$ ,  $\overline{QX} \cong \overline{TX}$

Prove:  $\triangle QXR \cong \triangle TXS$

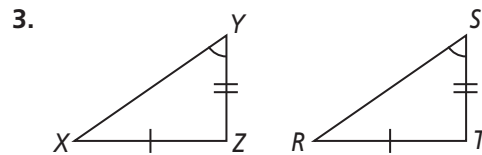


What other information, if any, do you need to prove the two triangles congruent by SAS? Explain. To start, list the pairs of congruent, corresponding parts you already know.



$\overline{AB} \cong \overline{FG}$  and  $\overline{BC} \cong \overline{GH}$

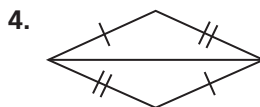
Need  $\angle B \cong \angle G$ ; these are the included  $\angle$ .



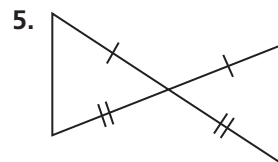
$\overline{XZ} \cong \overline{RT}$  and  $\overline{YZ} \cong \overline{TS}$  and  
 $\angle Y \cong \angle S$

need  $\angle Z \cong \angle T$  or  $\overline{XY} \cong \overline{RS}$

Would you use SSS or SAS to prove these triangles congruent? If there is not enough information to prove the triangles congruent by SSS or SAS, write *not enough information*. Explain your answer.



SSS; third side is shared by both  $\triangle$  and is  $\cong$  to itself by Refl. Prop. of  $\cong$ .



SAS; vertical  $\angle$  are  $\cong$ .

# 4-2

## Practice (continued)

Form K

### Triangle Congruence by SSS and SAS

Use the Distance Formula to determine whether  $\triangle FGH$  and  $\triangle JKL$  are congruent. Justify your answer.

6.  $F(0, 0)$ ,  $G(0, 4)$ ,  $H(3, 0)$  To start, find the lengths of the corresponding sides.  
 $J(1, 4)$ ,  $K(-3, 4)$ ,  $L(1, 1)$

$$FG = \sqrt{(0 - 0)^2 + (0 - 4)^2} = \boxed{4}$$

$$JK = \sqrt{(1 - (-3))^2 + (4 - 4)^2} = \boxed{4} \text{ Yes; they are } \cong \text{ by SSS.}$$

$$GH = \boxed{5}$$

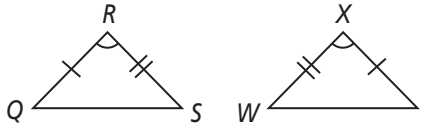
$$KL = \boxed{5}$$

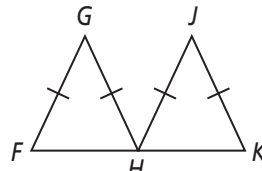
$$HF = \boxed{3}$$

$$LJ = \boxed{3}$$

7.  $F(-2, 5)$ ,  $G(4, -3)$ ,  $H(4, 3)$  No; they are not  $\cong$  because  $\overline{FH}$  and  $\overline{JL}$   
 $J(2, 1)$ ,  $K(-6, 7)$ ,  $L(-6, 1)$  have different lengths.

Can you prove the triangles congruent? If so, write the congruence statement and name the postulate you would use. If not, write *not enough information* and tell what other information you would need.

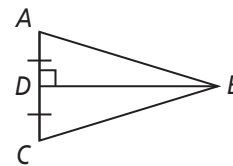
8.   
Yes;  $\triangle QRS \cong \triangle YXW$  by SAS.

9.   
not enough information; need  $\overline{FH} \cong \overline{HK}$  to apply SSS or  $\angle G \cong \angle J$  to apply SAS

10. Reasoning Suppose  $\overline{AB} \cong \overline{DE}$ ,  $\angle B \cong \angle E$ , and  $\overline{AB} \cong \overline{BC}$ . Is  $\triangle ABC$  congruent to  $\triangle DEF$ ? Explain. Not necessarily;  $\overline{EF}$  may not be  $\cong$  to  $\overline{BC}$ .

11. Given:  $\overline{BD}$  is the perpendicular bisector of  $\overline{AC}$ .

Prove:  $\triangle BAD \cong \triangle BCD$



Statements	Reasons
1) $\overline{BD}$ is the perpendicular bisector of $\overline{AC}$ .	1) Given
2) $\overline{AD} \cong \overline{CD}$	2) Definition of segment bisector
3) $\angle ADB$ and $\angle CDB$ are right $\angle$ s.	3) Definition of perpendicular
4) ? $\angle ADB \cong \angle CDB$	4) ? All right angles are $\cong$ .
5) ? $\overline{BD} \cong \overline{BD}$	5) ? Reflexive Property of $\cong$
6) ? $\triangle BAD \cong \triangle BCD$	6) ? SAS